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ABSTRACT

This report offers an analysis of college faculty supply and demand as well as an evaluation of currently available data on this issue. The report was undertaken in response to three concurrent trends which point to significant faculty shortages beginning in 1995. The report begins with a descriptive overview of current faculty demographics that includes data on current shortages. Next, two major factors are reviewed that affect faculty demand: faculty attrition and student enrollment. The factors affecting faculty supply, the faculty pipeline, recruitment and retention, are then discussed. Faculty retirement and demand projection and student enrollment projections are presented, along with critical commentary about using and developing projections. The monograph concludes with suggestions on adequate data and useful models, compensation and recruitment, under-representation of minorities and women, flexible personnel policies, and professional development. It urges the increased understanding of issues concerning faculty supply and demand as institutions work to maintain quality faculty. The appendix includes a list of data sources. Contains 67 references. (JB)

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ED 370 471

## Bringing into Focus the Factors Affecting

# Faculty Supply and Demand

A Primer for Higher Education and State Policymakers

HE 027 431

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# Bringing Into Focus the Factors Affecting Faculty Supply and Demand

## A Primer for Higher Education and State Policymakers

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# Foreword

This report is presented as a primer to assist state and higher education policymakers and planners in understanding the complexity of factors affecting the future supply of faculty. It concludes with a list of initiatives that should receive serious consideration by policymakers if higher education's most valuable resource—its quality faculty—is to be protected.

Judith I. Gill, Director of the WICHE Office of Research and Policy Analysis, had primary responsibility for this study. The study is based on the comprehensive survey and analysis of the literature conducted by Stephen A. Norrell, Assistant to the Chancellor, University of Alaska Anchorage, who was a WICHE Visiting Scholar in 1989-90. Vonda Kiplinger, Senior Research Assistant, and Virginia Golder, Research Associate, reviewed and analyzed literature and assisted in the writing. Diana Vari, Research Assistant, and Paul Albright, Director of Communications, provided editorial assistance, and Kelly Zweifel, Senior Secretary, prepared successive drafts of the report.

The study was guided by an advisory committee of scholars on faculty issues. WICHE is indebted to them for the quality of their advice and the commitment they made to this project.

The advisory committee was established and this monograph was published with support from Teachers Insurance and Annuity Association — College Retirement Equities Fund (TIAA-CREF). We are grateful for their contribution and for the continuing support of Peggy Heim, Senior Research Officer.

*Boulder, Colorado*
*March 1992*

*Richard W. Jonsen, Executive Director*
*Western Interstate Commission for Higher Education*

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# I. Introduction

Many education researchers have predicted a 10- to 15-year faculty shortage beginning in 1995. They have cited three concurrent trends:

1. An increase in faculty retirements due to the large group hired during the 1960s and 1970s;
2. An increase in college enrollments; and
3. A decline in the number of doctoral recipients interested in a faculty career.

Other researchers, who may agree about the trends, are unwilling to predict a shortage. They note serious problems with the available data and the assumptions on which projections are based.

There is, however, a consensus that the evidence warrants serious study of the issue. The possibility of a shortage in higher education's greatest resource—its quality faculty—is cause for significant concern.

Most studies on faculty supply and demand use national databases or focus on specific disciplines. These studies provide important information on faculty supply at a national level. However, the highly aggregated data on which they are based have limited usefulness for state and higher education policymakers who need information on faculty in their state's colleges and universities. Institutional and state studies are needed to highlight factors affecting faculty supply and demand.

This primer has been prepared to assist state and higher education policymakers and planners in understanding the factors affecting faculty supply and demand. The primer's development was guided by an advisory committee of scholars specializing in faculty issues (see page xi).

The primer begins with a descriptive overview of current faculty demographics that includes data on current shortages. Next, two major factors are reviewed that affect faculty demand: faculty attrition and student enrollment. The factors affecting faculty supply—the faculty pipeline, recruitment and retention—are then discussed. Faculty retirement and demand projections and student enrollment projections are presented, along with critical commentary about using and developing projections.

The monograph concludes with suggestions for initiatives that would increase the understanding of faculty supply and demand and assist institutions in maintaining quality faculty. The appendix includes a list of relevant data published periodically.

# II. Characteristics of Current Faculty

The characteristics of current higher education faculty affect future faculty supply and demand. The 1988 National Survey of Postsecondary Faculty (NCES, 1990a-e) is the most recent and comprehensive database on faculty.[1] The annual ACE surveys on *Campus Trends* (El-Khawas, 1989, 1990, and 1991) provide the most comprehensive information on campus perceptions of faculty-related characteristics. These two sources will be used in this chapter to present an overview of faculty characteristics.

## Faculty Characteristics

### Estimated Number of Postsecondary Faculty

The estimated number of postsecondary faculty is based on data from the National Survey of Postsecondary Faculty (NCES, 1990b).

- In 1987, there were 631,983 faculty in higher education institutions, 470,291 full-time and 161,692 part-time.
- Public four-year institutions were the largest employers of full-time faculty: 96,228 in research universities and 147,015 in other four-year public institutions.
- Public two-year institutions employed 91,559 full-time faculty.
- One-quarter of regular instructional faculty in higher education were employed part-time, and one-half of these were at public two-year institutions.
- Independent institutions employed 135,489 full-time faculty: 39,136 in research universities and 96,353 in other four-year institutions.

**Table 2.1**
**Number of Full-Time and Part-Time Faculty in Institutions of Higher Education, 1987-88**

| | PUBLIC | | | INDEPENDENT | | TOTAL |
|---|---|---|---|---|---|---|
| Faculty | Research University | Other 4-year | 2-year | Research University | Other 4-year | |
| Full-time | 96,228 | 147,015 | 91,559 | 39,136 | 96,353 | 470,291 |
| Part-time | 10,163 | 29,062 | 80,814 | 8,466 | 33,187 | 161,692 |
| Total | 106,391 | 176,077 | 172,373 | 47,602 | 129,540 | 631,983 |

Adapted from: NCES, 1990b, pp. 9-10.

1 The National Center for Education Statistics (NCES) has its second National Survey of Postsecondary Faculty under way. Data will be available in 1994.

## Age

In 1987, the majority of full-time faculty in all institutions was age 45 or older (see Table 2.2). Generally, full-time faculty in public institutions were older than those in independent institutions. Part-time faculty usually were younger than full-time faculty, particularly in two-year and other four-year institutions (see Table 2.3).

- In the public sector, about 60 percent of full-time faculty were aged 45 or older in 1987.
- Forty-eight percent of faculty in independent research universities and 55 percent in other independent four-year institutions were 45 or older in 1987.

**Table 2.2**
**Age of Full-Time Faculty by Institutional Type, 1987-88 (Percent)**

| | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| Age | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| Under 30 | 1 | 2 | 2 | 1 | 2 |
| 30-44 | 39 | 37 | 36 | 51 | 43 |
| 45-54 | 33 | 35 | 39 | 27 | 31 |
| 55-64 | 24 | 22 | 20 | 18 | 18 |
| 65+ | 3 | 3 | 3 | 3 | 6 |

Adapted from: NCES, 1990b, p. 9.

**Table 2.3**
**Age of Part-Time Faculty by Institutional Type, 1987-88 (Percent)**

| | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| Age | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| Under 30 | 5 | 6 | 4 | 10 | 4 |
| 30-44 | 44 | 56 | 57 | 43 | 43 |
| 45-54 | 16 | 23 | 24 | 30 | 31 |
| 55-64 | 21 | 12 | 12 | 11 | 14 |
| 65+ | 14 | 4 | 3 | 6 | 9 |

Adapted from: NCES, 1990b, p. 10.

## Gender

The majority of faculty is male. There is a significant difference between the percentage of male and female faculty members who hold full-time appointments. This difference is not as significant among part-time faculty members; in fact, females are in the majority of part-time faculty at "other four-year" public colleges/universities. Males dominate the full-time faculty ranks at research universities 4 to 1.

**Table 2.4**
**Gender Distribution of Full-Time and Part-Time Faculty by Institutional Type, 1987-88 (Percent)**

| | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| Gender | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| Full-time | | | | | |
| Male | 79 | 73 | 62 | 81 | 72 |
| Female | 21 | 27 | 38 | 19 | 28 |
| Part-time | | | | | |
| Male | 67 | 46 | 58 | 58 | 55 |
| Female | 33 | 54 | 42 | 42 | 45 |

Adapted from: NCES, 1990b, p. 13.

## Academic Rank of Full-Time and Part-Time Faculty

In all public four-year colleges and universities and in independent research universities, a higher percentage of faculty members held the academic rank of full professor than any other rank. Only 10 percent of full-time faculty held a rank below the level of assistant professor; however, the majority of part-time faculty held the rank of instructor or lecturer.

A comparison of appointment by faculty rank is not appropriate between two-year and four-year institutions. In many two-year institutions, the only faculty rank is instructor.

**Table 2.5**
**Academic Rank of Full-Time Faculty by Institutional Type, 1987-88**

| | PUBLIC | | INDEPENDENT | | | |
|---|---|---|---|---|---|---|
| Faculty | Research University | Other 4-year | Research University | Other 4-year | Total 2-year | Total 4-year |
| Full[1] | 45 | 36 | 39 | 31 | 16 | 37 |
| Associate | 28 | 28 | 25 | 26 | 9 | 27 |
| Assistant | 21 | 24 | 29 | 32 | 11 | 26 |
| Instructor | 3 | 8 | 3 | 8 | 33 | 6 |
| Lecturer | 3 | 2 | 2 | 0 | 1 | 2 |
| Other ranks[2] | * | 1 | 1 | 0 | 2 | 1 |
| Not applicable[3] | 0 | 0 | * | 2 | 28 | 1 |

* Percentage of faculty in these cells less than 1 percent.

[1]Includes distinguished/named professors.

[2]Includes faculty with no formal rank.

[3]No ranks designated at institution.

Adapted from: NCES, 1990b, p. 16.

**Table 2.6**
**Academic Rank of Part-Time Faculty by Institutional Type, 1987-88 (Percent)**

| | PUBLIC | | INDEPENDENT | | | |
|---|---|---|---|---|---|---|
| Faculty | Research University | Other 4-year | Research University | Other 4-year | Total 2-year | Total 4-year |
| Full[1] | 19 | 5 | 5 | 3 | 3 | 6 |
| Associate | 18 | 3 | 8 | 5 | 1 | 6 |
| Assistant | 12 | 18 | 25 | 13 | 1 | 16 |
| Instructor | 31 | 39 | 26 | 52 | 74 | 42 |
| Lecturer | 17 | 31 | 25 | 21 | 5 | 25 |
| Other ranks[2] | 3 | 4 | 1 | 4 | 1 | 3 |
| Not applicable[3] | 0 | * | 9 | 3 | 14 | 2 |

* Percentage of faculty in these cells less than 1 percent.

[1]Includes distinguished/named professors.

[2]Includes faculty with no formal rank.

[3]No ranks designated at institution.

Adapted from: NCES, 1990b, p. 17.

## Tenure Status of Full-Time Faculty

In 1987, the majority of faculty was tenured. The percentage of tenured faculty was higher at public institutions than at independent colleges and universities.

**Table 2.7**
**Tenured Full-Time Faculty by Institutional Type, 1987-88 (Percent)**

| PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|
| Research University | Other 4-year | 2-year | Research University | Other 4-year |
| 69 | 63 | 60 | 54 | 52 |

Adapted from: NCES, 1990b, p. 15.

## Faculty with Ph.D.s or First-Professional Degrees

Although the majority of full-time faculty at four-year institutions had doctoral or first-professional degrees, many part-time faculty did not, and less than 20 percent of faculty at two-year institutions had doctorates. Part-time faculty at independent colleges/universities were more likely to hold a doctorate or first-professional degree than their colleagues in public colleges/universities.

**Table 2.8**

**Percentage of Full-Time and Part-Time Faculty with a Doctoral or First-Professional Degree by Institutional Type, 1987-88 (Percent)**

| | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| Faculty | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| Full-time | 90 | 74 | 19 | 93 | 72 |
| Part-time | 56 | 39 | 12 | 72 | 34 |

Adapted from: NCES, 1990b, p. 4.

## Current Faculty Shortages

Three surveys by the American Council on Education (ACE) of senior academic administrators, e.g., academic vice presidents, provosts, and deans, present evidence that institutions currently are having difficulty in recruiting new faculty (El-Khawas, 1989, 1990, and 1991). Data from the National Survey of Postsecondary Faculty also support concerns that a shortage may have begun.

In the 1989 and 1991 ACE surveys, senior academic officers were asked to identify shortages by discipline. Shortages were noted in every discipline, although the degree of shortage varied by discipline and institutional type. A comparison of results from the two surveys shows a steady increase in the number of unfilled positions in almost every field (see Table 2.9).

**Table 2.9**

**Percentage of Institutions in 1989 and 1991 Unable to Find a Qualified Person to Fill a Vacant Faculty Position, by Discipline (Percent)**

| | Public 2-year | | Public 4-year | | All Independent | | Total | |
|---|---|---|---|---|---|---|---|---|
| Subject Areas | 1989 | 1991 | 1989 | 1991 | 1989 | 1991 | 1989 | 1991 |
| Arts and Humanities | 4 | 11 | 3 | 6 | 3 | 1 | 4 | 6 |
| Foreign Languages | 9 | 18 | 14 | 22 | 8 | 14 | 10 | 18 |
| Social Sciences | 4 | 4 | 3 | 3 | 3 | 9 | 3 | 6 |
| Biological Sciences | 14 | 16 | 9 | 15 | 11 | 10 | 11 | 13 |
| Physical Sciences | 21 | 23 | 11 | 19 | 10 | 15 | 14 | 19 |
| Computer Sciences | 29 | 41 | 61 | 54 | 34 | 45 | 38 | 46 |
| Mathematics | 23 | 32 | 37 | 36 | 21 | 25 | 25 | 30 |
| Engineering | 20 | 24 | 30 | 26 | 4 | 13 | 15 | 20 |
| Health Professions | 32 | 64 | 20 | 23 | 15 | 21 | 22 | 37 |
| Business | 18 | 23 | 73 | 61 | 33 | 41 | 36 | 39 |
| Education | 4 | 2 | 14 | 17 | 5 | 19 | 7 | 12 |
| Vocational-technical fields | 22 | 19 | 3 | 6 | 5 | 0 | 11 | 9 |

Adapted from: El-Khawas, 1989, p. 18 and El-Khawas, 1991, p. 36.

Academic areas that experienced the largest percentage of unfilled faculty positions in 1989 were the same ones identified in 1991. Unfilled positions were largest in 1989 and 1991 in computer science (38 and 46 percent), business (36 and 39 percent), mathematics

(25 and 30 percent), and the health professions (22 and 37 percent). Although public two-year and independent institutions note a significant increase in the number of unfilled computer science faculty positions, this was not the case with public four-year institutions, where the percentage of unfilled positions declined during the two-year period from 61 to 54 percent. Nevertheless, 54 percent of unfilled faculty positions in computer science is very significant.

Significant increases from 1989 to 1991 are noted in the number of unfilled faculty positions at independent institutions among education faculty (an increase from 5 to 19 percent); among faculty in the health professions, especially at public two-year colleges (an increase from 32 to 64 percent); and in foreign language faculty positions at all colleges/universities.

Between 1991 and 1996, continued faculty shortages are anticipated in those fields now experiencing problems. However, there is concern about shortages in additional fields (see Table 2.10).

At public four-year colleges/universities, concern is shifting to faculty availability in the disciplines. Senior academic officials reflected growing concern about shortages between 1989 and 1991 in the following areas: social sciences (8 to 22 percent); biological sciences (19 to 36 percent); and the physical sciences (34 to 45 percent).

**Table 2.10**

**Percentage of Institutions in 1989 and 1991 Indicating an Expected Faculty Shortage During the Following Five Years, by Discipline (Percent)**

| | Public 2-year | | Public 4-year | | All Independent | | Total | |
|---|---|---|---|---|---|---|---|---|
| Subject Areas | 1989 | 1991 | 1989 | 1991 | 1989 | 1991 | 1989 | 1991 |
| Arts and Humanities | 13 | 15 | 19 | 29 | 7 | 20 | 11 | 20 |
| Foreign Languages | 18 | 31 | 23 | 25 | 12 | 16 | 16 | 24 |
| Social Sciences | 7 | 18 | 8 | 22 | 8 | 13 | 8 | 17 |
| Biological Sciences | 18 | 29 | 19 | 36 | 16 | 15 | 17 | 25 |
| Physical Sciences | 39 | 32 | 34 | 45 | 17 | 24 | 27 | 32 |
| Computer Sciences | 33 | 34 | 59 | 44 | 54 | 34 | 49 | 36 |
| Mathematics | 39 | 42 | 52 | 42 | 28 | 31 | 36 | 37 |
| Engineering | 24 | 22 | 31 | 32 | 8 | 13 | 18 | 21 |
| Health Professions | 35 | 41 | 21 | 24 | 22 | 21 | 26 | 30 |
| Business | 11 | 17 | 59 | 46 | 46 | 48 | 38 | 36 |
| Education | 2 | 13 | 17 | 18 | 12 | 17 | 10 | 16 |
| Vocational-technical fields | 34 | 42 | 6 | 7 | 12 | 5 | 18 | 20 |

Adapted from: El-Khawas, 1989, p. 19 and El-Khawas, 1991, p. 36.

Information about unfilled faculty positions adds to our understanding of supply and demand. The 1988 National Survey of Postsecondary Faculty (NCES, 1990a) provides estimates of unfilled full-time faculty positions in fall 1987 and the reasons for those vacancies (see Tables 2.11 and 2.12).

- Research universities had the greatest proportion of departments with three or more unfilled faculty positions.

- The reasons most frequently cited for vacant faculty positions were:
  —*unable to locate qualified applicants*,
  —*qualified applicants would not accept terms of employment*,
  —*vacancy occurred too late to fill position*,
  and for independent research universities only,
  —*decided to fill position with part-timers*.

- The fields with the greatest numbers of unfilled full-time faculty positions were:
  —*health sciences* (57 percent),
  —*business* (55 percent),
  —*engineering* (48 percent), and
  —*agriculture and home economics* (45 percent).

**Table 2.11**
**Departments with Unfilled Full-Time Faculty Positions by Institutional Type, Fall 1987 (Percent)**

| Number of Unfilled Positions | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| 0 | 36 | 63 | 88 | 47 | 81 |
| 1 | 24 | 20 | 8 | 23 | 11 |
| 2 | 20 | 9 | 3 | 11 | 5 |
| 3 | 9 | 3 | 1 | 6 | 2 |
| 4 | 4 | 3 | * | 2 | * |
| 5+ | 7 | 2 | 0 | 11 | 1 |

* Percentage of departments in these cells is less than 1 percent.

Adapted from: NCES, 1990a.

**Table 2.12**
**Reasons for Unfilled Full-Time Faculty Positions by Institutional Type, Fall 1987 (Percent)**

| Reasons for Unfilled Positions | PUBLIC | | | INDEPENDENT | |
|---|---|---|---|---|---|
| | Research University | Other 4-year | 2-year | Research University | Other 4-year |
| Unable to locate qualified applicants[1] | 28 | 14 | 4 | 14 | 7 |
| Qualified applicants would not accept terms of employment (e.g. salary, location) | 21 | 12 | 1 | 15 | 5 |
| Resources not available for hiring | 9 | 8 | 2 | 0 | 4 |
| Declining enrollment | * | 1 | 1 | 5 | 1 |
| Decided to fill position with part-timer(s) | 8 | 6 | 3 | 14 | 7 |
| Vacancy occurred too late to fill position | 26 | 12 | 3 | 2 | 6 |

[1]Average percentage of "yes" response to each category, based on responses of all department chairs in each institutional type.

*Percentage of faculty in these cells less than 1 percent.

Adapted from: NCES, 1990a.

## Recruiting and Hiring

Recent reports that the faculty shortage has begun (El-Khawas, 1989, 1990, and 1991) are based partly on increasing difficulties in recruiting and hiring qualified faculty. Survey data point to problems with the quality of applicants and in getting top applicants to accept appointments. These problems are not distributed evenly across institutional type (see Table 2.13).

**Table 2.13**
**1990 and 1991 Experiences in Recruiting Full-Time Faculty (Percent)**

| | Public 2-year | | Public 4-year | | All Independent | | Total | |
|---|---|---|---|---|---|---|---|---|
| | 1990 | 1991 | 1990 | 1991 | 1990 | 1991 | 1990 | 1991 |
| **Quality of applicants has declined** | | | | | | | | |
| Yes, generally | 12 | 12 | 4 | 5 | 2 | 3 | 6 | 7 |
| Yes, in a few fields | 31 | 34 | 35 | 34 | 29 | 25 | 31 | 30 |
| **Taking longer to find qualified persons** | | | | | | | | |
| Yes, generally | 22 | 32 | 21 | 17 | 19 | 15 | 20 | 22 |
| Yes, in a few fields | 47 | 34 | 55 | 51 | 39 | 36 | 45 | 38 |
| **Greater difficulty in getting top applicants to accept positions** | | | | | | | | |
| Yes, generally | 23 | 26 | 25 | 17 | 20 | 12 | 22 | 19 |
| Yes, in a few fields | 43 | 28 | 49 | 50 | 35 | 37 | 41 | 36 |
| **Lower percentage of offers accepted** | | | | | | | | |
| Yes, generally | 12 | 12 | 19 | 9 | 12 | 4 | 13 | 8 |
| Yes, in a few fields | 27 | 30 | 32 | 32 | 20 | 23 | 25 | 28 |

Adapted from: El-Khawas, 1990, p. 23 and El-Khawas, 1991, p. 33.

Higher education administrators are concerned about the effect of a faculty shortage on their institutions. Although their concern was somewhat less in 1991 than in 1990, the figures are still very significant. In 1991, 44 percent indicated concern about a general faculty shortage in their institutions and 82 percent were concerned about a shortage in a few departments. Many institutions are using new resource management strategies to improve their recruiting and hiring success (El-Khawas, 1990 and 1991) (see Table 2.14).

The 1991 ACE survey reports that the strategy used most frequently to offset a faculty shortage is to move part-time faculty into full-time positions: about one-half of administrators reported that their institution had done this in a few fields, and another 6 percent indicated this was generally done. Independent institutions and public two-year colleges were most likely to use this strategy.

It should be noted that unlike the ACE survey, the National Study of Postsecondary Faculty survey reported only a small percentage of the departmental chairs using this strategy, and the highest response rate (14 percent) was from independent research universities.

Other frequently used strategies include recruiting new faculty at very competitive salaries and hiring faculty in advance of expected vacancies. Forty-eight percent of administrators in 1991 reported hiring some faculty at salaries above the salary scale, and 27 percent reported hiring junior faculty at salaries above those of some senior faculty in the same department. Twelve percent of administrators reported hiring some faculty in advance of expected vacancies in a few fields, and another 3 percent reported that their institution had done so in general.

**Table 2.14**
**1990 and 1991 Other Experiences in Recruiting Full-Time Faculty (Percent)**

| | Public 2-year | | Public 4-year | | All Independent | | Total | |
|---|---|---|---|---|---|---|---|---|
| | 1990 | 1991 | 1990 | 1991 | 1990 | 1991 | 1990 | 1991 |
| **Concerned about predicted faculty shortages as they might affect:** | | | | | | | | |
| Institution generally | 56 | 43 | 74 | 58 | 48 | 38 | 56 | 44 |
| A few departments | 87 | 88 | 91 | 88 | 89 | 72 | 89 | 82 |
| **Moved part-time faculty into full-time positions** | | | | | | | | |
| Yes, generally | 14 | 13 | 2 | 4 | 4 | 1 | 8 | 6 |
| Yes, in a few fields | 53 | 56 | 39 | 31 | 54 | 51 | 50 | 49 |
| **Hired some faculty at salaries above salary scale** | | | | | | | | |
| Yes, generally | 7 | 5 | 16 | 14 | 11 | 5 | 10 | 7 |
| Yes, in a few fields | 25 | 26 | 59 | 53 | 49 | 49 | 41 | 41 |
| **Hired new junior faculty at salaries above those of some senior faculty in same department** | | | | | | | | |
| Yes, generally | 3 | 1 | 11 | 11 | 2 | 1 | 4 | 3 |
| Yes, in a few fields | 12 | 9 | 49 | 51 | 24 | 26 | 25 | 24 |
| **Hired some faculty in advance of expected vacancy** | | | | | | | | |
| Yes, generally | 1 | 4 | 7 | 3 | 6 | 2 | 4 | 3 |
| Yes, in a few fields | 4 | 3 | 15 | 17 | 14 | 19 | 10 | 12 |

Adapted from: El-Khawas, 1990, pp. 23-24 and El-Khawas, 1991, pp. 33-34.

## A Summary Comment

Data on the characteristics of current faculty and the evidence of current shortages reveal significant differences among institutional types and disciplines. These data highlight the importance of knowing the faculty profile at each institution and across colleges and universities within a state's higher education system. Specific problematic areas in recruiting and hiring faculty must be identified in order to be addressed. New recruitment strategies should be discussed at both the institutional and state level.

# III. Factors Affecting Faculty Demand

The demand for faculty is based on expected enrollments, the number of students who can be served by each faculty member, the number of faculty who must be replaced because of retirement, death, or attrition for other reasons, and new faculty members needed for new courses and programs. These demands vary from one institution to another.

A great deal of attention has focused recently on faculty replacement needs caused by the retirement of the large faculty group hired during the growth years of the 1960s and early 1970s. However, retirement is only one part of the faculty demand equation, and it is not the only reason faculty members leave higher education. Further, studies using a national database do not consider faculty mobility among institutions, which is not attrition from higher education but *is* a factor in institutional faculty replacement needs. This chapter will focus on factors affecting faculty attrition and student enrollment, the two major forces affecting faculty demand.

## Faculty Attrition

Faculty attrition occurs for the following reasons:

- Retirement
- Death or illness
- Acceptance of non-academic employment
- Denial of tenure or non-renewal of contract
- Transfer to administrative or other non-faculty higher education position

### The Aging Professoriate

Recent studies on faculty demand focus on faculty retirement and factors influencing retirement. The most obvious factor is age, and data from several sources confirm that the professoriate in this country is aging.

**Nationally.** Bowen and Schuster (1986) predicted that the mean age of faculty would rise steadily from 1985 to the year 2000. This was the first major study to project a faculty shortage. Recently, NCES reported that nearly 60 percent of the full-time faculty and 43 percent of the part-time faculty in 1987 will be age 60 or older by the year 2003 (NCES, 1990b).

**Arts and Sciences.** A comparison of 1977 and 1987 data of arts and sciences faculty shows the percentage of faculty less than 40 years of age decreased from 42 percent in 1977 to 22 percent in 1988. Conversely, the proportion of faculty over 49 was 27 percent in 1977 but 39 percent in 1987. Data by institutional sector show that comprehensive universities and "other four-year" institutions had the oldest faculty (82 percent over 40

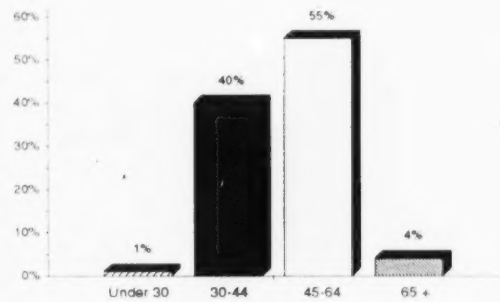
years old), and liberal arts colleges had the highest percentage of faculty under 40 (29.3 percent) (Bowen and Sosa, 1989).

**Disciplines.** Bowen and Sosa (1989) data also demonstrate a shift toward an older faculty in some disciplines. In 1987, the youngest faculty were in mathematics (69 percent under age 49); the oldest in physics/astronomy and humanities (48 and 44 percent respectively were older than 49). With the exception of mathematics, more than one-third of the faculty in every discipline will be 65 years old by 2002.

## Retirement Rates

The age profile of current faculty shows a "bulge" in the number who will reach retirement age by the year 2000 (see Figure 3.1). This bulge is comprised of the large number of faculty hired between the mid-1960s and the early 1970s. Several studies predict that the aging of this large cohort will result in retirement increases beginning in the late 1990s and continuing through the first decade of the 21st century (Bowen and Schuster, 1986; Porter and Czujko, 1986; Buchen, 1987; Connellan, 1987; McGuire and Price, 1990; Lozier and Dooris, 1991).

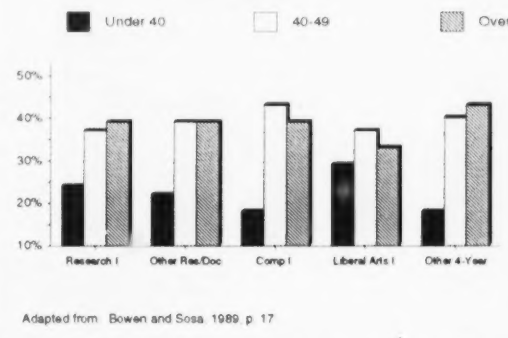
**Figure 3.1: Age Distribution of Full-Time Faculty**
**Fall 1987**




Adapted from: NCES, 1990b, p. 9

Bowen and Sosa also examine 1987 age distributions across five higher education sectors—Research I, Other Research/Doctorate, Comprehensive I, Liberal Arts I, and Other Four-Year (see Figure 3.2). Comprehensive institutions and those classified as "Other Four-Year" had measurably older faculty in 1987 (approximately 82 percent over the age of 40) than other types of institutions. Liberal arts colleges have the highest percent of faculty under 40 and the lowest percent of faculty over 49 (29.3 percent and 33.4 percent, respectively).

**Figure 3.2: Percentage Age Distribution of Faculty by Sector, 1987**




Adapted from: Bowen and Sosa, 1989, p. 17

A recent study by Lozier and Dooris (1991) estimates faculty retirement rates. They found that in 101 four-year baccalaureate, comprehensive, and doctoral institutions, 5.8 percent of faculty aged 50 or older retired in 1987-88. The highest retirement rates were among

faculty age 65 and older. Disciplines that experienced the highest retirement rates in 1987-88 were library science, agriculture, architecture, and education.[2] Disciplines with the lowest retirement rates were home economics, computer and information sciences, and engineering.

### Mandatory Retirement Legislation

Some have suggested that the Age Discrimination in Employment Act (ADEA) amendments that forbid institutional policies requiring mandatory faculty retirement based on age may stall some predicted retirements. However, three recent studies conclude that the end of mandatory retirement will have little impact on faculty retirement decisions.

Lozier and Dooris (1991), in their study of 518 faculty, conclude that the impact of uncapping mandatory retirement (to begin in 1994) will be gradual on overall faculty retirement patterns. Finances will be the most important criterion in a faculty member's decision to retire.

Sharon P. Smith (1991), who conducted the Project on Faculty Retirement, found no significant difference in faculty retirement age at 33 selective liberal arts colleges and public universities that voluntarily abolished mandatory retirement. The findings include:

- Average retirement age is highest in independent universities (66.8 years) and lowest in liberal arts colleges (65.3).
- There is little difference in average retirement age by discipline.
- Professors teaching "good" students or teaching at "good" institutions are more likely to postpone retirement.
- Faculty retire at a later age when research is their primary role and they have few teaching assignments.
- Uncapping mandatory retirement has not appreciably affected average retirement age at selective liberal arts colleges and prominent public universities.

The third study, one requested by Congress to analyze "the potential consequences of the elimination of mandatory retirement in institutions of higher education" concluded that "at most colleges and universities, few tenured faculty would continue working past age 70 if mandatory retirement is eliminated" (Hammond and Morgan, 1991).

### Attrition for Other Reasons

The faculty member leaving higher education for reasons other than retirement or death typically is young and nontenured. Although it is assumed that a significant portion of younger faculty leave because tenure is denied, there are no data to support or refute this assumption.

The tenured faculty member who leaves higher education altogether does so because of a combination of low salary **and** poor working conditions. However, tenured faculty may

2 These retirement rates are based on the **total** number of faculty, not on those age 50 or older.

leave their institution for another institution because of low salary **or** poor working conditions (Rosenfeld and Jones, 1988; Youn and Zelterman, 1988).

### Interinstitutional Mobility

Studies projecting faculty supply and demand do not take into account faculty mobility among institutions. Yet, when faculty members leave an institution, they need to be replaced.

A study by Pion et al (1989) shows the importance of considering faculty mobility among institutions when estimating attrition rates. Their study of psychology faculty found that the number of faculty taking other academic positions was four times higher than the number leaving higher education. Their data also show that 40 percent of all newly hired psychology faculty (sample size 425) came from faculty positions at other institutions.

What role does faculty salary play in interinstitutional mobility? Ehrenberg, et al (1989) use data to model faculty turnover rates from 1970-71 through 1988-89. The study suggests that faculty compensation rates did not, in general, affect overall retention rates. However, when examined by academic rank, higher compensation levels did increase the retention of assistant and associate professors, but had no effect on retaining full professors. Their data also suggest that salary issues have a greater effect on mobility within higher education than attrition from higher education.

Faculty compensation is only one of the factors impacting interinstitutional mobility. Matier (1990) surveyed 221 faculty members at two research institutions (one urban and one rural) to learn the factors influencing faculty members' decisions to stay or leave when job offers were made by other institutions. Six of the top seven reasons for departing were intangible benefits such as research opportunities, institutional reputation, rapport with colleagues, and departmental loyalty. The tangible benefits most often identified were better equipment and better salary. The study also found that in a majority of cases, a strong internal push, as well as an external pull, were needed for faculty to leave.

## Student Demand

The demand for faculty is affected inevitably by the population it serves. Therefore, institutional leaders need to understand the factors that affect student enrollment, the characteristics of the students, and their choice of programs.

### Student Enrollment

During the 1980s, higher education planners expected the decline in the number of 18- to 24-year-olds to result in a decline in higher education enrollments. This did not occur. Although the 18- to 24-year-old population decreased 10 percent in the 1980s (U.S. Bureau of the Census), undergraduate enrollment in the nation's higher education institutions increased 17 percent between 1978 and 1988.[3]

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3 This includes full- and part-time students in two- and four-year institutions. Unless otherwise indicated, data are from the National Center for Education Statistics, Integrated Postsecondary Data System (IPEDS).

The declining college-age population was offset by increased college attendance rates among both traditional and non-traditional students. As a result, the character of the undergraduate population changed.

- The percentage of 18- and 19-year-olds enrolled in college increased from 36 percent in 1978 to 42 percent in 1988 (U.S. Bureau of the Census, School Enrollments—Social and Economic Characteristics P-20, Nos. 346 and 443).
- The number of first-time freshmen declined 1 percent between 1978 and 1988, but the number of undergraduates increased 17 percent.
- The percentage of undergraduates enrolled part-time increased from 38 percent in 1978 to 41 percent in 1988.
- Between 1980 and 1988, the number of students age 35 and over increased 32.7 percent, and students age 25-34 years increased 3.1 percent (Frances, 1989).
- The number of women enrolled in undergraduate education increased 25 percent between 1978 and 1988, but the number of male students increased only 8 percent.
- Non-White and Latino students increased as a percentage of total enrollments. Nineteen percent of the nation's undergraduates were non-White and Latino in 1988, compared with 17 percent in 1978.

Increases in the number of older students in higher education have been called "one of the more remarkable developments in higher education in recent years" (Brazziel, 1989:116).

- Over 40 percent of all college students are 25 years of age or older.
- More than 80 percent of people over age 25 have a high school diploma.
- Over 40 percent of people age 25 or older have attended college (Brazziel, 1989).

This difference between high school and college completion rates for the older population indicates the potential for increased college enrollments by a substantial number of people who are 25 years of age or older. While these students are not usually included in the college-going population, they are a significant population group from which future college enrollments may be recruited.

### College Attendance Rates by Race/Ethnicity

The number of non-White or Latino undergraduates enrolled in institutions of higher education increased approximately 40 percent between 1978 and 1988. However, this increase was fueled more by demographic changes than increased college attendance rates.

The enrollment of African-Americans, American Indians, Alaskan Natives, and Latinos in institutions of higher education is well below that expected, given their representation in the college-age population. Moreover, college attendance rates by African-American students actually declined. The percentage of recent African-American high school graduates attending college fell from 65 percent in 1978 to 45 percent in 1988. As a group, Asians and Pacific Islanders are well represented among the nation's undergraduates.

However, some Asian/Pacific Islander sub-populations, e.g., Native Hawaiians, Guamian- and Samoan-Americans, have relatively low levels of educational attainment.

Graduation from high school is one of the most important determinants of whether a person will enroll in postsecondary education, regardless of racial/ethnic background. Sixty-one percent of White high school students who graduated in spring 1988 enrolled in college in fall 1988; however, only 43 percent of all White 18-year-olds were enrolled in college in fall 1988. For African-Americans and Latinos the corresponding figures for 1988 are: 45 percent of African-American high school graduates enrolled in college the following fall, but only 29 percent of all 18-year-old African-Americans were enrolled; 57 percent of graduating Latinos enrolled in college, but only 27 percent of all 18-year-old Latinos were enrolled (U.S. Bureau of the Census, 1990, School Enrollment Characteristics 1988, P-20 No. 443).

### Enrollment Trends by Discipline

Data on faculty attrition by discipline is only one category of data needed to discuss faculty demand by discipline. Data on student choice of major and student enrollment by discipline also are important to projections of faculty demand by discipline.

**Student Choice of Major.** The annual survey of freshmen conducted by the Cooperative Institutional Research Program (CIRP) at the University of California, Los Angeles provides the best national data on enrollment trends. Astin, Green, and Korn (1987) and Green (1989) analyzed the CIRP data to determine shifts in the choice of majors by freshmen over the 23-year period from 1966 to 1988.

According to Astin, Green, and Korn (1987), the "data point to sharp and continuing declines in student interest in virtually every field that has traditionally been associated with a liberal arts education" (pp. 15-16). For example, between 1966 and 1985, the number of freshmen who wanted to major in English dropped from 4.5 percent to about 1 percent, and the number preferring to major in other humanities declined from 9 percent in 1970 to less than 4 percent in 1985. Green (1989) reported that between 1966 and 1988, the percentage of entering freshmen choosing science and mathematics majors fell from 11.5 percent to 5.8 percent, with the steepest declines in mathematics and physical sciences. During this same time period, interest in computer science, engineering and business increased, with business majors climbing from 15 percent to 25 percent. However, the number of freshmen majoring in engineering and computer science has declined since 1982 and represents the single most significant shift in career preferences in the 23 years that CIRP data have been collected.

**Trends in Baccalaureate Degrees Awarded.** Bowen and Sosa (1989) analyzed trends in baccalaureate degrees for their projections of faculty demand. They highlight a significant shift away from arts and sciences degrees. In 1970, 40 percent of all baccalaureate degrees were awarded in the arts and sciences and only 20 percent were in engineering and business. By 1983, the distribution had shifted to 25 percent for arts and sciences and approximately 33 percent for engineering and business. Between 1983 and 1985, both the decline in arts and sciences degrees and the rise in business degrees leveled off, and the percentage of degrees awarded in engineering continued to increase. By 1985, the arts and sciences share of baccalaureate degrees had declined to just under 25 percent, while the share awarded in engineering and business had increased to about 37 percent.

The trends cited in Bowen and Sosa may be reversing. For example, by the year 1986-87, about the same share of all baccalaureate degrees (33 percent) was awarded in arts and sciences and in engineering and business (*Chronicle of Higher Education*, 1989). Data indicate that between 1986 and 1989 the number of baccalaureate degrees in engineering declined from 78,178 to 68,824 (*Scientific, Engineering, Technical Manpower Comments*, 1989). This suggests that 1985-86 may have been the peak year for engineering baccalaureate degrees. The opposite may be true for history: data provided by the American Historical Association (1990) show that 1984-85 yielded the lowest number of bachelor's degrees since 1969-70, but that the number of history bachelor's degrees, between 1984-85 and 1987-88, increased by 13.4 percent.

**Dynamics of Degree Choice in Science and Engineering.** The National Science Foundation (1989a) presents data offering some insight into the dynamics of degree choice within the natural sciences and engineering. The percentage of the 22-year-old population that obtains degrees in natural science and engineering has been very stable since 1960, ranging from 3.7 percent to 4.2 percent and averaging around 4 percent. The approximate 4 percent ceiling has remained stable even though there have been wide swings in the apportionment among subdisciplines within the natural sciences and engineering (Collins, 1988). If computer science is included, the 4 percent average is raised slightly; however, the data support the hypothesis that most of the growth in computer science baccalaureates did not come from the same student pool as did natural science and engineering baccalaureates (National Science Foundation, 1989a). These data suggest that regardless of enrollment, about 4 percent of all 22-year-olds will earn degrees in a natural science. They further raise the possibility that new disciplines, such as computer science, will draw from areas outside the present natural science and engineering student pool, and that natural science and engineering enjoy a discrete student pool.

## A Summary Comment

The primary factors affecting faculty demand are faculty attrition and student enrollment. A reasonable estimate of faculty demand at the institutional level could be calculated if there were sufficient information on faculty and student characteristics and on future institutional plans. Data important to this calculation include: faculty characteristics, retirement rates, reasons for faculty attrition, student demographics, enrollment projections, and faculty/student ratios. It is important that faculty characteristics data be collected by discipline. It also is important to understand student enrollment patterns, e.g., program majors and university and college course requirements, and the dynamics of student program choice. Student characteristics that may impact faculty demand, such as advising and remedial education, also need clarification.

# IV. Factors Affecting Faculty Supply

Concerns about an adequate supply of qualified faculty are based on the possibility that certain factors affecting the supply/demand equilibrium will occur simultaneously:

- Continued decline in the number of U.S. citizens earning doctorate degrees and interested in faculty careers;
- Continued underrepresentation of minority students in graduate programs; and
- Continued competition with the non-academic sector for new doctorates and experienced faculty;

*while*

- Enrollments increase; and
- Faculty retirement rates increase.

## The Faculty Pipeline

Projections that the faculty supply will be inadequate to meet demand are based primarily on two assumptions:

1. The annual production of new doctorates entering the American labor market will remain constant or decline.
2. The percentage of new doctorates seeking academic appointments will decline due to competitive pressure from non-academic sectors.

The majority of studies dealing with faculty supply issues focus on four-year institutions and limit consideration of the potential faculty applicant pool to new doctoral recipients. Consideration is rarely given to:

- Ph.D. recipients who are not currently employed as faculty;
- Graduate and first-professional students who are not planning on academic careers but who might be enticed into the faculty ranks;
- Academic administrators who do not hold regular faculty positions;
- Early retirees from non-academic jobs;
- Part-time faculty who could transfer to full-time status;
- Foreign scholars; and
- Professionals with master's degrees.

Several studies have suggested that if a faculty shortage does occur, this non-traditional pool of potential faculty could provide a substantial supply source for higher education institutions (Bowen and Schuster, 1986; Ehrenberg, 1991; Locke, 1989).

Recent trends in graduate enrollments and degree completions show an increase and therefore may lead to an increase in the faculty pipeline. Syverson and Zhao (1990) present data from a survey of 536 graduate schools (1,021,919 students) showing total graduate enrollments increased by 3 percent between 1986 and 1988. Increases were

observed in all discipline groups and at all types of institutions. The percentage increases in the number of female graduate students and in the number of minority students, except Native American women, were greater than the overall percentage increase. The number of degrees awarded also rose, resulting in a 10 percent increase in master's degrees and a 7 percent increase in the number of doctoral degrees.

### New Doctoral Recipients

The number of new doctorates awarded in all fields has been reported annually since 1958 by the National Research Council in its Survey of Earned Doctorates.

- Between 1958 and 1972 the annual production of doctorates almost quadrupled, from 8,800 in 1958 to about 33,000 in 1972.
- Between 1972 and 1987 the total number of new doctorates produced annually remained relatively stable (only a 10% increase).
- Since 1987 there has been a slow but significant increase of almost 1,000 doctorate recipients each year. By 1989 the total number of doctorates awarded was 34,319, the highest number since 1973.

**Foreign Nationals.** The number of doctorate-earning foreign nationals has increased significantly, but many of these degree recipients do not plan to remain in the United States, thus, adversely affecting the pool of potential faculty.

- Between 1960 and 1989, degrees awarded to U.S. citizens declined from 88 to 74 percent; the number of degrees awarded to foreign nationals rose seven times, from 1,176 to 8,195.
- In 1960 temporary residents earned only 9 percent of all U.S. doctorates; in 1989 they earned nearly 21 percent.

**Field of Doctorate.** A comparison of degrees awarded in 1973 and 1989 shows an increase in the number of doctorates awarded in all major broad discipline areas except the humanities and education. However, there was a decrease in the proportion of degrees awarded to U.S. citizens in all fields (see Table 4.1).

**Racial and Ethnic Minorities.** The U.S. minorities' share of earned doctorates remained relatively constant between 1979 and 1989. However, there are differences by race and ethnicity.

- The percentage of doctorates awarded to Native Americans changed very little (0.3 percent in 1979 and 0.4 percent in 1989).
- The proportion of Latino doctoral recipients increased (from 1.9 percent in 1979 to 2.5 percent in 1989) as did Asians (from 1.8 percent to 2.7 percent).
- The share of doctorates awarded to African-Americans decreased from 4.4 percent in 1979 to 3.6 percent in 1989.

When labor work force plans are examined, the National Research Council data indicate a decrease in employment commitments for all racial and ethnic groups, but an increase in commitment for post-doctoral study.

**Table 4.1**
**Number of New Doctorates Earned by Broad Discipline, Total and U.S. Citizens, 1973 and 1989**

| Specialty | 1973 | 1989 |
|---|---|---|
| Physical Sciences Total | 5,311 | 5,460 |
| U.S. Citizens | 79% | 64% |
| English Total | 3,364 | 4,536 |
| U.S. Citizens | 65% | 45% |
| Life Sciences Total | 5,167 | 6,343 |
| U.S. Citizens | 80% | 76% |
| Social Sciences Total | 5,758 | 5,955 |
| U.S. Citizens | 87% | 80% |
| Humanities Total | 5,414 | 3,558 |
| U.S. Citizens | 91% | 83% |
| Education Total | 7,238 | 6,265 |
| U.S. Citizens | 95% | 90% |
| Professional/Other Total | 1,503 | 2,202 |
| U.S. Citizens | 84% | 74% |

Adapted from: NRC, 1990.

**Women.** In 1973, women earned only 18 percent of all doctoral degrees; by 1989 they earned more than 36 percent. During this time, the number of degrees awarded to men declined by nearly 5,900, a decrease of more than 21 percent (NRC, 1990).

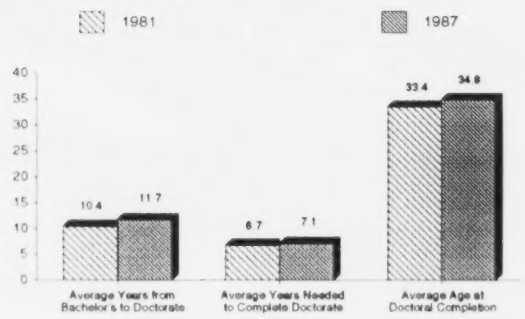
## Delays in Entering the Academic Labor Market

Although there was considerable variation among disciplines, degree candidates in all disciplines took more years to complete their doctoral degrees in 1987 than in 1981.

- In 1981, the average graduate student completed doctoral studies between 7.2 and 13.5 years after receiving the bachelor's degree, needed between 5.7 and 7.7 years to do so, and was between 29.6 and 37.3 years of age when the doctorate was completed (Bowen and Schuster, 1986).

- By 1987, the average doctoral student completed the degree between 7.1 to 16.2 years after the bachelor's degree, needed 5.8 to 8.4 years to do so, and was between 29.8 and 39.7 years old when the degree was completed (*Chronicle of Higher Education*, 1989) (see Figure 4.1).

**Figure 4.1: Doctoral Completion Statistics**




Adapted from: *Chronicle of Higher Education*, 1989 and Bowen and Schuster, 1986, p. 173.

- Recent NRC data show a slow but steady increase in the time-to-degree data beginning in 1965 (see Table 4.2).

**Table 4.2**
**Median Years to Degree for Doctorate Recipients for Selected Years, 1969 - 1989**

| | 1969 | 1973 | 1977 | 1981 | 1985 | 1989 |
|---|---|---|---|---|---|---|
| All Fields | 8.0 | 8.4 | 8.7 | 9.4 | 10.2 | 10.5 |

Adapted from: NRC, 1990, p. 16.

Should these trends continue, or even remain at present levels, the rate at which doctoral degree recipients are produced will slow, at least over the short term, and the recipients will spend fewer years as faculty members before reaching retirement age (Bowen and Schuster, 1986; Bowen and Sosa, 1989).

Post-doctoral appointments also delay entrance into the academic labor market. An increasing number of new doctoral recipients are completing one or more years of post-doctoral study before entering the job market, and some established doctoral recipients employed in other sectors are taking time out to accept post-doctoral appointments. The National Research Council (1990) data show that in 1989, 26 percent of doctoral recipients planned to do post-doctoral study.

Ehrenberg (1991) estimates that the percentage of new science and engineering doctorates (U.S. citizens) who took post-doctoral appointments increased from 22 percent in 1970 to 39 percent in 1988, and the number accepting academic positions right after graduate school decreased from 44 percent in 1970 to 24 percent in 1988.

In 1989, post-doctoral appointments show considerable variation by type of field.

- Almost one-half of physical and life science graduates planned post-doctoral studies (NRC, 1990).
- Less than 6 percent of humanities and education graduates planned post-doctoral studies (NRC, 1990).

## Faculty Recruitment

In 1986, Bowen and Schuster (1986) projected that the supply of new doctorates would be adequate. However, they expressed concern about the quality of faculty available for appointments. What are the factors that will influence higher education's ability to recruit quality faculty?

### Faculty Salaries

There is clear evidence that faculty salaries lag in parity when compared with the purchasing power of salaries in the early 1970s or with those of other sectors of the economy today (Bowen and Sosa, 1989; ACE, 1990; Carnegie Foundation, 1989).

- Although faculty salaries had their greatest gains between 1960 and 1970, those gains matched the *average* of salary increases in other sectors of the economy (Bowen and Sosa, 1989).

- Between 1971 and 1984, faculty salaries, when adjusted for inflation, declined 18.7 percent, while those in other sectors increased 1.8 percent (Bowen and Sosa, 1989).
- Although there have been recent salary adjustments, long-term salary gains, as of 1989, have failed to keep pace with the CPI.
- In 1988, college faculty ranked only sixth in median weekly earnings for several professions, and most which ranked higher required only the bachelor's degree for career entry, e.g., engineering, marketing.

Although these issues are significant and require attention, the greatest problem for the 1990s may well be faculty salary inequities within an institution. Inequities have occurred because of competitive pressures from non-academic sectors and from other institutions. These pressures, coupled with limited salary funding sources, have resulted in both salary dispersion and salary compression (Hansen, 1988). Salary *compression* occurs when salaries offered to new faculty are higher or increase more rapidly than does the average salary for experienced faculty. Thus, salary differentials among academic ranks within a discipline are reduced, or compressed. Salary *dispersion* occurs when higher salaries are paid to faculty in high-demand disciplines. This results in a wider salary range across disciplines at a given academic rank.

These conditions are common among higher education institutions. They will become more costly as annual increments are granted and senior faculty salaries are adjusted upward, or as faculty demands shift. Of the 366 institutions surveyed by El-Khawas (1989), only 65 percent reported that their salary for continuing faculty was competitive with similar institutions. Seventy-one percent said they offered competitive salaries to new junior faculty, but only 60 percent said that salaries for new senior faculty hires were competitive.

Faculty salary inequity, however, is not a major factor affecting faculty attrition once tenure is granted (Ehrenberg et al, 1989). Therefore, how does it affect the academy? It may be that salary inequity has its greatest impact on the recruitment of new talent.

### Faculty Compensation: Tangible and Intangible Benefits

Research by Matier (1991) examines a broad spectrum of factors that may influence faculty members' or new graduates' decisions to accept an academic appointment. Data were collected from two institutions' faculty who were offered positions for the 1988-89 academic year. The results indicate that of the important factors influencing faculty's decisions to accept a position, eight were "intangible" benefits:

- reputation of institution;
- teaching assignments/opportunities;
- reputation of department;
- career advancement opportunities;
- reputation of associates;
- congeniality of associates;
- research opportunities; and
- rapport with departmental leaders.

The ninth factor, and the only "tangible" one was the teaching/research load. These nine factors were consistent for all faculty, regardless of the institution making the offer or the faculty member's decision to accept.

### Competition with Non-Academic Careers

The National Research Council (1990) reports on the career plans of new doctorates (see Table 4.3). Between 1973 and 1989 there was a significant decline in the percentage of new doctorates entering the education profession and a significant increase in those entering industry or self-employment.[4]

**Table 4.3**

**Employment Sector of Doctorate Recipients with Postgraduation Commitments in the United States - 1973, 1979, and 1989**

| Employment Sector | 1973 (%) | 1979 (%) | 1989 (%) |
|---|---|---|---|
| Academia | 64.3 | 54.4 | 51.3 |
| Industry/Self-Employed | 11.5 | 17.1 | 20.6 |
| Government | 11.6 | 13.1 | 10.7 |
| Other | 12.5 | 15.4 | 17.4 |

Adapted from: NRC, 1990, p. 21.

## Faculty Retention

Faculty retention is affected by compensation and work environment factors. Studies have shown:

- Higher compensation rates increase the retention of assistant and associate professors (Ehrenberg et al, 1989).
- Tenured faculty members leave higher education because of a combination of low salary **and** poor working conditions (Ehrenberg et al, 1989).
- Low salary **or** poor working conditions may cause tenured faculty members to leave their institution and move to another institution (Ehrenberg et al, 1989).
- Faculty members remain in higher education for intangible benefits (Matier, 1990).

### Faculty Work Environment

The work environment plays an important role in faculty retention, and therefore is prominent among the factors affecting faculty supply. Unlike the salary compensation package, where institutions have limited flexibility to provide incentives encouraging retention, institutions have greater opportunities to improve the work environment.

4 NRC data does not make a distinction between K-12 education and postsecondary education.

Institutional environment factors may affect faculty members' morale, their commitment to the institution, and subsequently, their productivity. According to Bowen and Schuster (1986), faculty place great value on an "intrinsic reward system" and the collegiality associated with the professoriate, and they are willing to accept significant salary inequity because of it.

The changes occurring in the higher education work environment and the effect of those changes on faculty morale were summarized by Bowen and Schuster (1986). They argued that in 1984, faculty morale and collegiality had changed for the worse in more cases than they had changed for the better. The faculty had become a fragmented body whose sense of loyalty did not extend beyond departmental or discipline boundaries. Differences in tenure status, longevity, employment status, gender, and ethnicity contributed to this fragmentation and loss of collegiality. In addition, salary compression and dispersion affected faculty morale (Bowen and Schuster, 1986).

There is evidence that faculty morale has improved since 1984. The Carnegie Foundation (1989) found that faculty attitudes about their profession generally were improving. For example, the percentage of faculty who said they would not choose an academic career again decreased from 21 percent in 1984 to 15 percent in 1989; however, this still exceeded the 1969 level of 9 percent. On the other hand, when compared to previous surveys, more faculty believed the profession was secure and collegial and that it was a good time to begin an academic career.

## A Summary Comment

Studies on faculty supply frequently focus on new Ph.D. recipients, but the faculty pipeline can be expanded. The definition of quality faculty should not be limited to Ph.D. recipients currently employed as faculty. Quality faculty should be defined within the structure of an institution's role and mission. Moreover, the role and mission of the research university should not provide the definition for the quality faculty member at the liberal arts or community college.

Although faculty salaries dominate discussions of recruitment and retention, quality work place environment is a factor deserving far greater attention. The intangible benefits of the faculty lifestyle are key criteria in decisions to remain at or leave a campus. Institutions may have far greater leverage in attracting and keeping quality faculty once they understand the dynamics of their work place. Faculty entry and exit interviews will provide data important to this understanding.

# V. Projections

The overall demand for faculty is generated by the combination of a need to fill new positions added because of expanded enrollments or new courses of study, and a need to replace those who leave the professoriate.

Projections of faculty demand rely on assumptions based on five major factors: (1) the number of faculty who must be replaced because of retirement; (2) the number of faculty who must be replaced because of attrition for other reasons; (3) the number of faculty who must be replaced because of mortality; (4) the number of faculty needed in new program areas or for program growth and development; and (5) the number of students who must be served and how many students can be served by each faculty member.

Among those factors, only mortality appears to be relatively constant and is not expected to change.

## Projections of Faculty Retirements

Most retirement rate projections share two important assumptions: (1) the average retirement age of 65 years will not change; and (2) economic conditions will not change sufficiently either to delay or accelerate retirements. However, not all studies agree that there will be a bunching of faculty exits by the year 2000.

In their projections of faculty exits, Bowen and Sosa (1989) suggest that the flow of faculty from higher education will be stable during each five-year period from 1987 to 2012. These findings differ from the retirement rates estimated in a number of studies which project increases in the rate of faculty retirements beginning in the early to mid-1990s (Porter and Czujko, 1986; Buchen, 1987; Connellan, 1987). They also differ from the projections of Lozier and Dooris (1991) and McGuire and Price (1990), who forecast that faculty will retire at a greater rate by 2002-03.

How can these differences be explained? Some of the differences between Bowen and Sosa's projections and those of other researchers may be due to different assumptions used in the models, particularly estimates of "quit rates" or "survival rates," and different populations, e.g., faculty in the arts and sciences, faculty in particular types of institutions, etc.

Lozier and Dooris (1991) is the most recent study projecting faculty retirements to the 21st Century. Based on past retirement trends, the age distribution of faculty, and various assumptions about "quit rates" for older faculty, Lozier and Dooris developed a high, low, and standard series of projections for faculty retirements. The standard projection indicates that retirements will increase by 24 percent between 1987-88 and 2002-03, and that the largest number of retirements will occur during the latter part of the 15-year period, from 1998-99 through 2002-03.

Lozier and Dooris expect considerable variability in retirement by discipline. They project:

- Retirements among faculty in languages and letters is now at its peak, i.e., those occurring between 1988-89 to 1992-93.
- Annual retirement rates of social sciences and psychology faculty will remain stable.
- Retirement among life sciences faculty will increase slightly until the mid-1990s and then return to 1987 levels by 2002-03.
- Retirements among mathematical and physical sciences faculty will show a modest but steady increase through 2002-03.
- The retirement rate will increase most rapidly in computer and information sciences, although the actual number retiring will be small.
- Retirements among business faculty will increase substantially between 1998-99 and 2002-03.

## Projections of Faculty Demand

There is little consensus on the projected number of new faculty needed by 2010, and direct comparisons among projections are impossible because studies focus on different types of faculty, different types of institutions, and project forward to different years.

**Nationally.** Bowen and Schuster (1986) estimated the net number of new faculty appointments needed from 1985 through 2009 would be between 359,000 and 645,000 depending on which set of assumptions was used. Their estimates were developed using nine different projections of faculty demand based on different combinations of assumptions about the 18- to 21-year-old population, student/faculty ratios, proportion of part-time faculty, increases in older students, increased research and service activity, and attrition rates. All of their projections, except one that assumes a steady state, indicate a decline in demand during the 1990-1994 period, then an increase through 2000-2004, followed by a decline through the year 2008.

**Arts and Sciences.** Bowen and Sosa (1989) project a demand for faculty in the arts and sciences between 1987 and 2012 of 150,469 to 181,315 faculty. Their projections are based on an estimation of the number of vacancies created by retirement, death, or attrition, the number of net new positions needed, projected enrollments, and changes in the faculty/student ratio.

**Small Liberal Arts Colleges.** McGuire and Price (1989) using a "faculty replacement needs model," project "a steep increase in the annual net loss of college faculty." Their projections indicate that there will be a 37 percent increase in the overall faculty replacement need between 1989 and 2003. The humanities will have the greatest replacement need before 2000; and the sciences will experience the greatest need after the year 2000.

**Natural Science and Engineering Faculty.** A National Science Foundation (NSF, 1989a) study projects, that based on historical trends, there will be a cumulative shortfall of natural science and engineering doctorates of 78,000 by the year 2006. The combined annual demand for replacement and new faculty in the natural sciences and engineering is expected to rise from the current need of 5,700 to 10,000 in 2006. The projections are

based on the assumption that the proportion of 22-year-olds who obtain bachelor's degrees and then go on for the doctorate will remain the same throughout the projection period.

## Projections Of Student Enrollment

When projections of faculty demand are made, they are based in part on assumptions regarding future student enrollments and teaching faculty/student ratios. Projections of student enrollments usually are based on population trends such as state birth patterns, migration rates, high school graduation rates, and institutional enrollment trends. Often, the population projections on which enrollment projections are based are computed at the national level. However, generalizations from national trends are inappropriate for state and institutional planning purposes, because there is wide variation among states and regions in the size and characteristics of their populations, as well as in high school graduation and higher education enrollment rates.

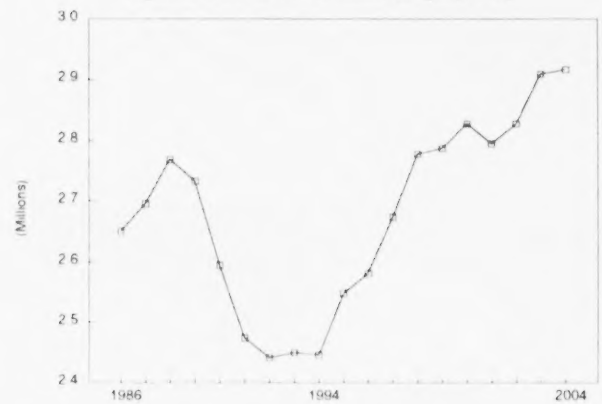
### High School Graduates

Births help to predict the size of the traditional college-age population in the future, but births are not exact predictors of future enrollments. The size of the college-age population 18 years later is influenced by a variety of factors. Most important are migration and persistence in high school.

Receiving a high school diploma or its equivalent is one of the most important indicators of whether or not a person will enroll in college. Therefore, projections of high school graduates commonly are used to project future college enrollments. These projections extend trends in births, migration, and persistence in high school forward into the future. They indicate the number of graduates who will be in the pipeline if current drop-out rates and migration patterns do not vary significantly.

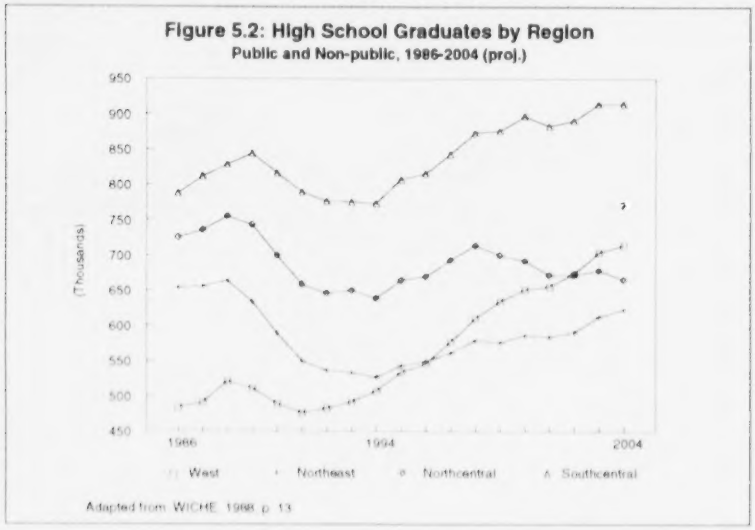
After rising to approximately 2.8 million in 1987-88, the number of high school graduates is expected to decline to about 2.4 million in 1991-92. After 1993-94 the number of graduates is expected to rise again. The high school graduating class of 2004 is expected to exceed the size of the class of 1988 by 5.2 percent (see Figure 5.1).

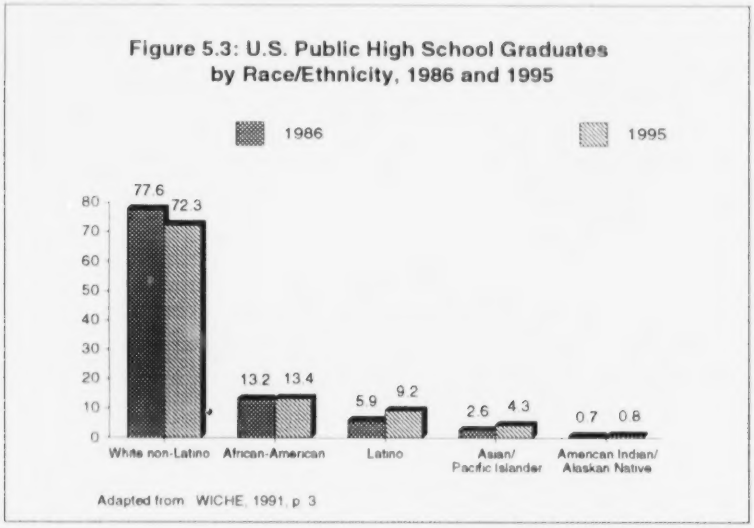
**Figure 5.1: United States**
**High School Graduates, 1986-2004 (projected)**




Adapted from: WICHE, 1988, p. 7

Each geographic region contributes differently to these trends. The number of high school graduates in the West is expected to increase 46.6 percent between 1986 and 2004. In 1986, the West ranked last among the regions in number of students graduating from high school. In the mid-1990s it will overtake the Northeast and Northcentral regions,




becoming the second largest region. The total number of graduates in the South/Southcentral region is projected to increase by 16 percent between 1986 and 2004. In contrast, the Northeast and Northcentral regions will experience losses of 4.7 percent and 8.3 percent respectively (see Figure 5.2).

At the same time the number of high school graduates is increasing, the racial/ethnic make up of the nation's high school graduates is changing. White non-Latinos, while still a majority, will be a smaller proportion of public high school graduates by 1995 (from 78 percent in 1986 to 72 percent in 1995). Latinos and Asians/Pacific Islanders will make up an increasing share of high school graduates. Latinos represented only 5.9 percent of all high school graduates in 1986, but they are expected to represent more than 9 percent of graduates by 1995. Asians/Pacific Islanders represented 2.6 percent of graduates in 1986 and will be more than 4 percent of graduates by 1995. The percent of African-Americans and American Indians/Alaskan Natives is expected to remain relatively stable (WICHE, 1991; see Figure 5.3).

## A Summary Comment

National projections of faculty demand are not good indicators of institutional faculty needs. Institutional projections require data on students and faculty by department, and the development of assumptions about the future consistent with institutional trends and future plans. If state planning needs dictate the use of institutional projections, care must be taken to assure that the definitions of faculty and students and the underlying assumptions are comparable across institutions.

# VI. Cautions on the Use of Projections

In general, predictions of a faculty shortage are based on faculty supply and demand projections. The usefulness of these projections depends on the validity of the assumptions and on the accuracy of the data used. The major sources of error associated with using databases to make projections are the quality and reliability of the data, the age of the data, and the use of noncomparable or inappropriate data.

This chapter focuses on problems frequently encountered in this review of the literature: inconsistencies in estimates of the current number of faculty, non-reliability of faculty data, and inappropriate use of available data. It concludes with examples of problematic assumptions used in the development of faculty supply and demand projections.

## Inconsistencies in Current Estimates of Faculty

One of the biggest problems higher education researchers, policymakers, and planners face in projecting future needs for faculty is that much of the published data on the *current* size of the faculty population are inconsistent and, in some cases, noncomparable. Unfortunately, it is very difficult for planners and policymakers to know which estimate or estimates they should use. This problem exists because of the lack of a consistent definition of faculty; it is compounded because many reports and studies provide no definitions.

## Quality and Reliability

A major concern of those involved in research on faculty supply and demand is the quality of the data collected and maintained by higher education institutions. No universal standards exist for data collection on the number and characteristics of faculties, and few institutions monitor faculty flow data. While some institutions maintain detailed data on each faculty member (age, sex, number of years of service), others are able to provide no more than a count of their faculty population. Moreover, the definitions of "faculty," "instructional faculty," and other key terms vary widely. These problems make it impossible to collect consistent data across institutions.

Many surveys on which faculty projections are based are designed as national probability samples large enough to provide estimates of their target populations at the national level, e.g., 101 institutions in the 1990 Lozier and Dooris study and 483 institutions in the 1988 National Survey of Postsecondary Faculty. However, these samples are not large enough to provide reliable estimates at the state level. Therefore, they are of little use to state-level planners and policymakers who need to know if there will be sufficient numbers of faculty for their state's institutions.

## Appropriateness and Comparability

Aggregated data can mask important variations among types of institutions or regions. Nationally aggregated data on higher education enrollments should not be used for state planning purposes because a state may have a very different higher education enrollment pattern than that of the national average. Highly aggregated data tend to result in inappropriate generalizations that may not apply to any of the component subgroups. Most of the available data on faculty are from national databases and cannot provide an accurate projection of activity at the state level.

Although a massive amount of data exists, much of it has been derived from different sources and should be used with caution. Drew and Tronvig (1988) review most of the databases and surveys specifically directed at science and engineering disciplines prior to 1987. They conclude that the American higher education enterprise is so highly differentiated that significant policy analysis cannot be based on the kinds of aggregated data typical of the results of national surveys. In their opinion, all but two of the surveys they reviewed were not of adequate sample size. Furthermore, there was an almost complete lack of item comparability among the surveys. Further support of this point comes from a 1989 report from the National Academy of Sciences, which states:

> It should be noted that descriptions of academic institutions are based on aggregated data for the entire enterprise or large sectors of it. Inferences for individual academic institutions should not be drawn from these data, as each university and college varies for all the characteristics described here (Government-University-Industry Research Roundtable, 1989).

Noncomparability of data presents a second major problem in the development of faculty supply and demand projections. Data obtained from two different surveys are sometimes used to demonstrate a trend. However, the data may not be comparable because two different populations were surveyed, or because terms used in the two surveys were defined differently. For example, "enrollment in higher education" may have been defined as "full-time equivalent students" in one survey, and as "head count" in the second.

## Assumptions Underlying Projections of Faculty Demand

Population projections are based on assumptions regarding expected rates of change or stability in the population of interest and on its characteristics. For example, projections of demand are based on assumptions about future enrollments, faculty/student ratios, faculty attrition rates, and possibly, assumptions regarding full-time/part-time ratios for faculty and/or students. The validity of the assumptions determines, in large part, the reliability of the projections.

Several recent publications which project faculty demand and supply are based on problematic assumptions that limit their usefulness. To illustrate, some of the assumptions of three of these studies are discussed below.

(1) An often-quoted study on issues related to faculty supply and demand, Bowen and Sosa's *Prospects for Faculty in the Arts and Sciences* (1989), uses several methodological procedures that limit its usefulness as a reference on future trends in the arts and sciences. One major assumption on which the projections are based is that the number of full-time equivalent (FTE) enrollments in the arts and sciences can be estimated on the basis of the percentage of baccalaureate degrees awarded in the arts and sciences. No data are offered to support the assumed direct relationship between degrees awarded and FTE students. This definition of enrollment does not account for students in other academic areas who are required to take arts and sciences courses and therefore contribute to the demand for arts and sciences faculty.

(2) The National Center for Education Statistics' projections of full-time and part-time faculty to the year 2000 (NCES, 1989) are problematic due to the assumptions, and to a lesser extent, the data, on which they are based. The faculty projections: (a) are based on projections of college enrollments; (b) assume that the faculty/student ratio will remain constant at the 1983 level; ***and*** (c) project the number of full-time faculty on the basis of the number of full-time students, and the number of part-time faculty on the basis of the number of part-time students. This latter component, in effect, assumes that full-time students will be taught only by full-time faculty and that part-time students will be taught only by part-time faculty.

(3) The two major studies on faculty supply and demand (Bowen and Schuster, 1986; Bowen and Sosa, 1989) focus on new doctorates, and to a lesser extent, students in the pipeline as the primary supply of new and replacement faculty. Major shortcomings of these studies include their relatively narrow focus on doctoral degree recipients, their failure to address adequately the important contributions of non-doctoral faculty and part-time faculty, and the potentially important pool of doctoral recipients who did not enter academe, but who are employed in government and industry. Also, neither study adequately considers the impact of a possible faculty shortage on the different types of institutions.

# VII. Issues And Initiatives

Regardless of differing views on the possibility of a faculty shortage, there are initiatives that should receive serious consideration by state and higher education policymakers and planners to protect higher education's most valuable resource—a quality faculty.

To prepare effectively for a possible faculty shortage, institutions must address issues directly affecting the supply of qualified faculty. These issues include:

- Compensating and recruiting faculty in a competitive marketplace;
- Increasing the number of minorities and women represented in higher education;
- Adopting more flexible academic personnel policies to address institutional needs; and
- Maintaining faculty vitality and productivity.

A comprehensive understanding of these issues and the relationship among all factors affecting faculty supply and demand requires the development of a reliable faculty database.

## Issue 1: Adequate Data and Useful Models

Reliable projections of faculty supply and demand depend on well-validated models, which in turn are based on databases that accurately describe higher education. Available data are based on relatively small samples and are so highly aggregated or narrowly focused, they are not appropriate for use in the development of institutional, state, and/or national policies.

As a result of non-standardized definitions, there is a significant lack of comparability among data available from governmental agencies, e.g., National Center for Education Statistics, National Science Foundation and higher education organizations, e.g., Carnegie Foundation, American Council on Education, American Association of University Professors.

Many faculty planning models rely on assumptions based on anecdotal information because there are little or no validated empirical data to support the formulation of relationships used in modeling. A related problem is that few institutions maintain faculty flow data that are adequate for planning purposes.

Because institutional data are not available, obtaining faculty data requires the researcher to collect information directly from the faculty, an expensive method. For this reason, sampling techniques are used to collect sufficient data for analysis at the national level, but this is insufficient to provide meaningful analysis at the state or institutional levels.

### Initiatives to be considered:

1. Institutional administrative databases should be expanded to capture and maintain biographical data, e.g., age, date of appointment, discipline, etc. about faculties. Faculty entry and exit interviews should be conducted to gain information on: why the faculty member accepted the appointment; the type of previous employment; the nature of other job offers; and, in the case of a faculty member leaving the institution, reasons why she or he is leaving. This information is important to understand faculty attrition (such as retirement or career change) and interinstitutional mobility.
2. The federal government, professional organizations, and individual institutions should cooperate to develop a system of standardized terms and definitions that could be used in modeling activity and the analysis of faculty supply and demand.
3. Faculty data collection should be coordinated and of sufficient sample size to yield information of value to all users.

## Issue 2:
## Compensation and Recruitment

Average faculty salaries are not competitive with industry and government salaries. A report from the American Council on Education (1990) shows that although recent gains have been made in faculty salary levels, as of 1989 long-term gains have failed to keep pace with the Consumer Price Index (CPI). In terms of 1972 dollars, salaries still lag the CPI by 8 to 12 percent. In 1988, college faculty ranked sixth in median weekly earnings for several professions, and most of those which ranked higher required only the bachelor's degree for career entry.

So-called "marketplace" compensation policies have helped ease some recruitment problems. The competition for faculty has driven entry level salaries upward and many institutions now offer substantial non-salary recruitment incentives. However, a negative effect of the competition is that traditional faculty salary structures have been disrupted, resulting in significant differences among faculty. Competition also has promoted interinstitutional "raiding" of "star" faculty.

Information is needed on the impact of salary inequities on disciplines which are not currently enjoying a high market demand but which are considered essential academic subjects, and on long-term faculty morale and commitment to the institution.

### Initiatives to be considered:

1. Salary equity issues need to be discussed at both the institutional and state levels. Policy studies are needed which review the costs and benefits associated with "marketplace" recruitment packages, and strategies should be designed to lessen the negative impacts of salary inequities on the campus.

2. The impact of interinstitutional raiding within a state's system of public higher education should be reviewed by institutions and statewide higher education offices.
3. Creative and flexible approaches to non-salary compensation programs are needed if institutions are to attract faculty candidates in a competitive market.
4. Higher education leaders must make an effective presentation to the general public and elected officials on the value and importance of competitive faculty salaries.

## Issue 3: Underrepresentation of Minorities and Women

Underrepresentation of minorities and women among students and faculty in higher education continues in spite of efforts to recruit students and develop a faculty reflecting the ethnic and gender diversity of the population it serves. The National Center for Education Statistics estimates that in 1987 only 6 percent of full-time faculty in postsecondary institutions were members of underrepresented minority groups: African-Americans, Latinos, and Native Americans. Women are better represented than minorities, but are more likely to be part-time faculty members (NCES, 1990a).

The intensity of competition for minority faculty members suggests that there is an increasingly critical shortage of quality minority faculty. The percentage of doctorates earned by underrepresented minorities—African-Americans, Latinos, and Native Americans—has declined from 5.1 percent of all doctorates conferred in 1979 to 4.3 percent in 1989. However, the pool of female Ph.D. recipients has been increasing, from 23 percent of all doctorates conferred in 1979 to 34 percent in 1989.

Institutions may further limit the pool of qualified minority and women faculty available to them by defining too narrowly their criteria for appointment. A hesitancy to hire their own doctorates and an emphasis on hiring from prestigious institutions also may unnecessarily limit the pool of applicants.

### Initiatives to be considered:

1. Institutions must be active participants in strategies to increase the participation of minorities in higher education. Institutions must recognize that the faculty pipeline begins long before the first college class. Higher education administrators and faculty need to work closely with elementary and secondary teachers to identify talented individuals and cultivate their development as prospective faculty members.
2. Institutional affirmative action initiatives may include:
   a. Programs for professional development opportunities for minorities who demonstrate potential as quality faculty members, but

who do not meet the institutional requirements for a tenure track appointment.

b. Programs that encourage minority students with the potential to pursue academic careers by providing financial and academic support at the undergraduate and graduate levels, with the promise of a faculty appointment upon completion of their studies.

c. Consortial agreements with other institutions to provide academic support and financial assistance for minority doctoral students or recipients. For example, individuals could receive some of their doctoral education or post-doctoral appointments at one institution with the prospect of a tenure-track appointment at another institution in the consortium.

3. Assistance to minority undergraduate and graduate students should be made available in the form of grants and should not be conditional upon entering an academic career.

4. The federal government needs to take general responsibility for assuring minority access to higher education. However, states have a parallel responsibility for providing higher education opportunities to the members of their diverse populations. Minority access, retention, and completion rates should be monitored by an appropriate state agency.

## Issue 4:
## Flexible Academic Personnel Policies

Institutional needs vary with time, place, and mission. An institution's ability to respond to short-term fluctuations in faculty demand may conflict with its long-term need to maintain a stable faculty. For example, academic policies must have the flexibility to deal with an enrollment decline that may be followed by a rapid enrollment increase.

Moreover, projected faculty shortages will have different effects on different types of institutions. An institution's role and mission should be the focal point in the development of flexible academic personnel policies.

### Initiatives to be considered:

1. Institutions should monitor their ability to respond to student needs and interests in a manner consistent with their mission, and should develop policies that encourage maintaining a stable and qualified faculty which best meets the needs of the institution. Institutional monitoring requires data on faculty retirement patterns, recruitment patterns, reasons for faculty attrition, use of part-time faculty, and faculty compensation packages. Such data need to be collected, maintained, and analyzed by discipline.

2. Part-time faculty are an essential institutional resource. Ensuring a quality pool of part-time faculty and maintaining the maximum commitment and participation from them may require changes in institutional compensation policies and institutional practices, including the participation of part-time faculty in governance and non-teaching activities.
3. Flexible retirement policies are needed which provide incentives for early retirement as well as for delayed retirement.

## Issue 5: Professional Development

Maintaining faculty renewal, vitality, and productivity are important institutional concerns that have been heightened by the congressional action eliminating the age-related mandate for retirement of tenured faculty members and by the potential faculty shortage. The shifting relationship between faculty supply and demand has led to the reconsideration of the benefits and costs of career-long professional development programs.

### Initiatives to be considered:

1. Academic evaluation systems need to be part of a professional development program and should be sufficiently flexible to accommodate changing patterns and levels of faculty productivity. Post-tenure reviews should be structured as part of a faculty professional development program.
2. Policy studies on career-long faculty productivity and effectiveness are needed so that expectations can be realistically defined and evaluated, especially with respect to mid- and late-career faculty.
3. Policies for early retirement or career change training programs should be available at the option of the institution and the faculty member.

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# Appendix

## Data Sources Available On A Periodic Basis

### American Association of University Professors

*The Annual Report on the Economic Status of the Profession*
Annual report based on annual survey of higher education institutions. This report provides information on college and university faculty salaries and benefits.

### American Council on Education

*Campus Trends*
Annual report (since 1984) based on annual surveys to provide current information on academic officers' perceptions about American higher education. In response to concerns about projected faculty shortages, the 1989, 1990, and 1991 surveys gathered information on faculty, current shortages, and the academic labor market.

### Carnegie Foundation for the Advancement of Teaching

*National Survey of Faculty*
Surveys conducted in 1984 and 1989 collected data on faculty demographics, academic background, faculty governance, promotion and tenure, faculty vitality, workload, and other topics. Although there is substantial overlap of items in the two surveys, the 1989 survey incorporated extensive changes in format and content, so that the two surveys are not strictly comparable.

### The Chronicle of Higher Education

*Almanac*
Annual report (since 1988) that compiles data about higher education in the nation and individual states. Information is provided on higher education faculty, enrollments, degrees awarded, the number of institutions, high school dropout rates, and age distribution of the United States population.

### Educational Testing Service

*Council of Graduate Schools/ Graduate Record Examination Annual Survey of Graduate Enrollment*
Annual survey (first conducted in 1986-87) of graduate programs at United States universities. Data are collected on the number of students enrolled in graduate programs, degree level, gender, race/ethnicity, citizenship, full and part-time status, etc. Subsequent report will compare current data with that of previous years.

## National Center for Education Statistics

*Degrees Conferred in Institutions of Higher Education by Race/Ethnicity and Sex*
Periodically updated report that provides time series data on degrees conferred in United States higher education institutions by degree level, gender, race/ethnicity, and field of study, etc.

*Digest of Education Statistics*
A comprehensive source book of education statistics for all levels of the United States educational system. This report is updated annually.

*Integrated Postsecondary Education Data System (IPEDS) Completions Survey*
Component of the Integrated Postsecondary Education Data System (IPEDS) annual survey series which collects data on number of degrees and other formal awards by postsecondary education institutions. Data from the survey are published annually in various reports and are available on magnetic tape and diskettes.

*Integrated Postsecondary Education Data System (IPEDS) Fall Enrollment Survey*
Component of the Integrated Postsecondary Education Data System (IPEDS) annual survey series which collects data on number of degrees and other formal awards by postsecondary education institutions. Data from the survey are reported annually in various reports and are available on magnetic tape and diskettes.

*National Survey of Postsecondary Faculty (NSOPF)*
Survey conducted in 1988. The 1988 sample survey collected data from 8,383 faculty (76 percent response rate), and 2,423 department chairpersons in 424 accredited public and independent four-year institutions and public two-year institutions, and academic officers (on institutional characteristics) (88 percent response rate). Data from the 1988 survey are published in three reports and are available on magnetic tape and diskettes. NCES has begun its second National Survey of Postsecondary Faculty. Data will be available in 1994.

*Projections of Educational Statistics to 2001*
Annually updated report provides projections about various educational topics, e.g., elementary, secondary, and higher education enrollments, number of high school graduates, higher education degrees awarded, and classroom teachers.

*Salaries of Full-Time Instructional Faculty Survey*
Component of the IPEDS survey that collects data on salaries, tenure, and fringe benefits, rank and gender for full-time instructional faculty at postsecondary education institutions. Data from the survey are available in various reports and on magnetic tapes.

## National Science Foundation/National Research Council

*Survey of Earned Doctorates*
Annual survey of all new doctorate recipients from United States institutions. Data are collected by discipline, gender, race/ ethnicity, baccalaureate institution, and other characteristics of new doctorates. Data are published annually in various reports and are available on diskettes.

*Survey of Doctorate Recipients*
Longitudinal survey that gathers demographic and employment data on Ph.D.s who have resided in the U.S. during the last 42 years. The survey has been conducted biennially since 1973 for scientists and engineers and since 1977 for humanities doctorates. Summary reports have been published biennially since 1977 as *Science, Engineering, and Humanities Doctorates in the United States.*

## Western Interstate Commission for Higher Education

*High School Graduates: Projections by State, 1986-2004*
Periodic report (1979, 1984, and 1988) providing projections of United States high school graduates by national total, regions, and states. The next update is planned for 1993.

Elementary and secondary enrollments and graduation rates, actual and projections for 1988-86 through 1994-95, by race and ethnicity for each state are provided in the WICHE report, *The Road to College: Educational Progress by Race and Ethnicity.*

These two reports are available in published form with supplemental data available on diskettes.

This publication is one in a series produced by the Western Interstate Commission for Higher Education (WICHE), focusing on the factors affecting faculty supply and demand.

Titles in this series are:

**Bringing Into Focus the Factors Affecting Faculty Supply and Demand: A Primer for Higher Education and State Policymakers** (2A210), 1991. This study presents a comprehensive review of the literature on factors affecting faculty supply and demand. Its objective is to provide information to state and higher education policymakers and planners to help guide the development of policies and practices affecting faculty supply and demand.

**The Literature on Factors Affecting Faculty Supply and Demand: An Annotated Bibliography** (2A211), 1991. This is an annotated bibliography of the recent literature on factors affecting faculty supply and demand.

**Faculty Retirement Projections Beyond 1994: Effects of Policy on Individual Choice** (2A212), 1991. This study examines the age distribution of faculty retirements at 101 institutions employing 35,000 faculty. It examines both historical retirement patterns and the distributions of faculty by age and discipline. Also examined are data from a survey of 500 retired faculty on factors influencing their retirement decision.

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